

§ 172.515

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Common name	Scientific name	Limitations
Walnut husks (hulls), leaves, and green nuts Woodruff, sweet	<i>Juglans nigra</i> L. or <i>J. regia</i> L. <i>Asperula odorata</i> L	In alcoholic beverages only
Yarrow	<i>Achillea millefolium</i> L	In beverages only; finished beverage thujone free ¹
Yerba santa	<i>Eriodictyon californicum</i> (Hook, et Arn.) Torr.	
Yucca, Joshua-tree	<i>Yucca brevifolia</i> Engelm.	
Yucca, Mohave	<i>Yucca schidigera</i> Roezl ex Ortgies (<i>Y. mohavensis</i> Sarg.).	

¹ As determined by using the method (or, in other than alcoholic beverages, a suitable adaptation thereof) in section 9.129 of the "Official Methods of Analysis of the Association of Official Analytical Chemists," 13th Ed. (1980), which is incorporated by reference. Copies may be obtained from the Association of Official Analytical Chemists International, 481 North Frederic Ave., suite 500, Gaithersburg, MD 20877-2504, or may be examined at the Office of the Federal Register, 800 North Capitol Street, NW., suite 700, Washington, DC 20408

[42 FR 14491, Mar. 15, 1977, as amended at 43 FR 14644, Apr. 7, 1978; 49 FR 10104, Mar. 19, 1984; 54 FR 24897, June 12, 1989]

§ 172.515 Synthetic flavoring substances and adjuvants.

Synthetic flavoring substances and adjuvants may be safely used in food in accordance with the following conditions.

(a) They are used in the minimum quantity required to produce their intended effect, and otherwise in accordance with all the principles of good manufacturing practice.

(b) They consist of one or more of the following, used alone or in combination with flavoring substances and adjuvants generally recognized as safe in food, prior-sanctioned for such use, or regulated by an appropriate section in this part.

Acetal; acetaldehyde diethyl acetal.
Acetaldehyde phenethyl propyl acetal.
Acetanisole; 4'-methoxyacetophenone.
Acetophenone; methyl phenyl ketone.
Allyl anthranilate.
Allyl butyrate.
Allyl cinnamate.
Allyl cyclohexaneacetate.
Allyl cyclohexanebutyrate.
Allyl cyclohexanehexanoate.
Allyl cyclohexanepropionate.
Allyl cyclohexanevalerate.
Allyl disulfide.
Allyl 2-ethylbutyrate.
Allyl hexanoate; allyl caproate.
Allyl α-ionone; 1-(2,6,6-trimethyl-2-cyclohexene-1-yl)-1,6-heptadiene-3-one.
Allyl isothiocyanate; mustard oil.
Allyl isovalerate.
Allyl mercaptan; 2-propene-1-thiol.
Allyl nonanoate.
Allyl octanoate.
Allyl phenoxyacetate.
Allyl phenylacetate.
Allyl propionate.
Allyl sorbate; allyl 2,4-hexadienoate.

Allyl sulfide.
Allyl tiglate; allyl *trans*-2-methyl-2-butenoate.
Allyl 10-undecenoate.
Ammonium isovalerate.
Ammonium sulfide.
Amyl alcohol; pentyl alcohol.
Amyl butyrate.
α-Amylcinnamaldehyde.
α-Amylcinnamaldehyde dimethyl acetal.
α-Amylcinnamyl acetate.
α-Amylcinnamyl alcohol.
α-Amylcinnamyl formate.
α-Amylcinnamyl isovalerate.
Amyl formate.
Amyl heptanoate.
Amyl hexanoate.
Amyl octanoate.
Anisole; methoxybenzene.
Anisyl acetate.
Anisyl alcohol; *p*-methoxybenzyl alcohol.
Anisyl butyrate.
Anisyl formate.
Anisyl phenylacetate.
Anisyl propionate.
Beechwood creosote.
Benzaldehyde dimethyl acetal.
Benzaldehyde glyceryl acetal; 2-phenyl-*m*-dioxan-5-ol.
Benzaldehyde propylene glycol acetal; 4-methyl-2-phenyl-*m*-dioxolane.
Benzethiol; thiophenol.
Benzoin; 2-hydroxy-2-phenylacetophenone.
Benzophenone; diphenylketone.
Benzyl acetate.
Benzyl acetoacetate.
Benzyl alcohol.
Benzyl benzoate.
Benzyl butyl ether.
Benzyl butyrate.
Benzyl cinnamate.
Benzyl 2,3-dimethylcrotonate; benzyl methyl tiglate.
Benzyl disulfide; dibenzyl disulfide.
Benzyl ethyl ether.
Benzyl formate.
3-Benzyl-4-heptanone; benzyl dipropyl ketone.

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Benzyl isobutyrate.	Cedarwood oil alcohols.
Benzyl isovalerate.	Cedarwood oil terpenes.
Benzyl mercaptan; α -toluenethiol.	1,4-Cineole.
Benzyl methoxyethyl acetal; acetaldehyde benzyl β -methoxyethyl acetal.	Cinnamaldehyde ethylene glycol acetal.
Benzyl phenylacetate.	Cinnamic acid.
Benzyl propionate.	Cinnamyl acetate.
Benzyl salicylate.	Cinnamyl alcohol; 3-phenyl-2-propen-1-ol.
Birch tar oil.	Cinnamyl benzoate.
Borneol; <i>d</i> -camphanol.	Cinnamyl butyrate.
Bornyl acetate.	Cinnamyl cinnamate.
Bornyl formate.	Cinnamyl formate.
Bornyl isovalerate.	Cinnamyl isobutyrate.
Bornyl valerate.	Cinnamyl isovalerate.
β -Bourbonene; 1,2,3,3a,3b β ,4,5,6,6a β ,6b α -decahydro- α -isopropyl-3a α -methyl-6-methylene-cyclobuta [1,2,3,4] dicyclopentene.	Cinnamyl phenylacetate.
2-Butanol.	Cinnamyl propionate.
2-Butanone; methyl ethyl ketone.	Citral diethyl acetal; 3,7-dimethyl-2,6-octadienal diethyl acetal.
Butter acids.	Citral dimethyl acetal; 3,7-dimethyl-2,6-octadienal dimethyl acetal.
Butter esters.	Citral propylene glycol acetal.
Butyl acetate.	Citronellal; 3,7-dimethyl-6-octenal; rhodinal.
Butyl acetoacetate.	Citronellol; 3,7-dimethyl-6-octen-1-ol; <i>d</i> -citronellol.
Butyl alcohol; 1-butanol.	Citronelloxyacetaldehyde.
Butyl anthranilate.	Citronellyl acetate.
Butyl butyrate.	Citronellyl butyrate.
Butyl butyryllactate; lactic acid, butyl ester, butyrate.	Citronellyl formate.
α -Butylcinnamaldehyde.	Citronellyl isobutyrate.
Butyl cinnamate.	Citronellyl phenylacetate.
Butyl 2-deenoate.	Citronellyl propionate.
Butyl ethyl malonate.	Citronellyl valerate.
Butyl formate.	<i>p</i> -Cresol.
Butyl heptanoate.	Cuminaldehyde; cuminal; <i>p</i> -isopropyl benzaldehyde.
Butyl hexanoate.	Cyclohexaneacetic acid.
Butyl <i>p</i> -hydroxybenzoate.	Cyclohexaneethyl acetate.
Butyl isobutyrate.	Cyclohexyl acetate.
Butyl isovalerate.	Cyclohexyl anthranilate.
Butyl lactate.	Cyclohexyl butyrate.
Butyl laurate.	Cyclohexyl cinnamate.
Butyl levulinate.	Cyclohexyl formate.
Butyl phenylacetate.	Cyclohexyl isovalerate.
Butyl propionate.	Cyclohexyl propionate.
Butyl stearate.	<i>p</i> -Cymene.
Butyl sulfide.	γ -Decalactone; 4-hydroxy-decanoic acid, γ -lactone.
Butyl 10-undecenoate.	γ -Decalactone; 5-hydroxy-decanoic acid, δ -lactone.
Butyl valerate.	Decanal dimethyl acetal.
Butyraldehyde.	1-Decanol; decyclic alcohol.
Cadinene.	2-Decenal.
Camphene; 2,2-dimethyl-3-methylenenorbornane.	3-Decen-2-one; heptylidene acetone.
<i>d</i> -Camphor.	Decyl acetate.
Carvacrol; 2- <i>p</i> -cymenol.	Decyl butyrate.
Carvacryl ethyl ether; 2-ethoxy- <i>p</i> -cymene.	Decyl propionate.
Carveol; <i>p</i> -mentha-6,8-dien-2-ol.	Dibenzyl ether.
4-Carvomenthenol; 1- <i>p</i> -menthen-4-ol; 4-terpinenol.	4,4-Dibutyl- γ -butyrolactone; 4,4-dibutyl-4-hydroxy-butyric acid, γ -lactone.
<i>cis</i> Carvone oxide; 1,6-epoxy- <i>p</i> -menth-8-en-2-one.	Diethyl sebacate.
Carvyl acetate.	Diethyl malate.
Carvyl propionate.	Diethyl malonate; ethyl malonate.
β -Caryophyllene.	Diethyl sebacate.
Caryophyllene alcohol.	Diethyl succinate.
Caryophyllene alcohol acetate.	Diethyl tartrate.
β -Caryophyllene oxide; 4-12,12-trimethyl-9-methylene-5-oxatricyclo [8.2.0 ^{4,6}] dodecane.	2,5-Diethyltetrahydrofuran.
	Dihydrocarveol; 8- <i>p</i> -menthen-2-ol; 6-methyl-3-isopropenylcyclohexanol.

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Dihydrocarvone.	Ethyl nonanoate.
Dihydrocarvyl acetate.	Ethyl 2-nonynoate; ethyl octyne carbonate.
<i>m</i> -Dimethoxybenzene.	Ethyl octanoate.
<i>p</i> -Dimethoxybenzene;	dimethyl
hydroquinone.	
2,4-Dimethylacetophenone.	Ethyl oleate.
α,α -Dimethylbenzyl isobutyrate; phenyldi-	Ethyl phenylacetate.
methylcarbinyl isobutyrate.	Ethyl 4-phenylbutyrate.
2,6-Dimethyl-5-heptenal.	Ethyl 3-phenylglycidate.
2,6-Dimethyl octanal; isodecylaldehyde.	Ethyl 3-phenylpropionate; ethyl hydrocinnamate.
3,7-Dimethyl-1-octanol; tetrahydrogeraniol.	Ethyl propionate.
α,α -Dimethylphenethyl benzylpropyl	Ethyl pyruvate.
benzylidemethylcarbinyl acetate.	Ethyl salicylate.
α,α -Dimethylphenethyl dimethylbenzyl carbinol.	Ethyl sorbate; ethyl 2,4-hexadienoate.
α,α -Dimethylphenethyl benzyldimethylcarbinyl butyrate.	Ethyl tiglate; ethyl <i>trans</i> -2-methyl-2-butenoate.
α,α -Dimethylphenethyl formate; benzyldimethylcarbinyl formate.	Ethyl undecanoate.
Dimethyl succinate.	Ethyl 10-undecenoate.
1,3-Diphenyl-2-propanone; dibenzyl ketone.	Ethyl valerate.
delta-Dodecalactone; 5-hydroxydodecanoic acid, deltalactone.	Eucalyptol; 1,8-epoxy- <i>p</i> -menthane; cineole.
γ -Dodecalactone; 4-hydroxydodecanoic acid γ -lactone.	Eugenyl acetate.
2-Dodecenal.	Eugenyl benzoate.
Estragole.	Eugenyl formate.
<i>p</i> -Ethoxybenzaldehyde.	Eugenyl methyl ether; 4-allylveratrole; methyl eugenol.
Ethyl acetoacetate.	Farnesol; 3,7,11-trimethyl-2,6,10-dodecatrien-1-ol.
Ethyl 2-acetyl-3-phenylpropionate; ethylbenzyl acetoacetate.	<i>d</i> -Fenchone; <i>d</i> -1,3,3-trimethyl-2-norbornanone.
Ethyl aconitate, mixed esters.	Fenchyl alcohol; 1,3,3-trimethyl-2-norbornanol.
Ethyl acrylate.	Formic acid
Ethyl <i>p</i> -anisate.	(2-Furyl)-2-propanone; furyl acetone.
Ethyl anthranilate.	1-Furyl-2-propanone; furyl acetone.
Ethyl benzoate.	Fusel oil, refined (mixed amyl alcohols).
Ethyl benzoylacetate.	Geranyl acetoacetate; <i>trans</i> -3,7-dimethyl-2,6-octadien-1-yl acetoacetate.
α -Ethylbenzyl butyrate; α -phenylpropyl butyrate.	Geranyl acetone; 6,10-dimethyl-5,9-undecadien-2-one.
Ethyl brassylate; tridecanedioic acid cyclic ethylene glycol diester; cyclo 1,13-ethylenedioxytridecan-1,13-dione.	Geranyl benzoate.
2-Ethylbutyl acetate.	Geranyl butyrate.
2-Ethylbutyraldehyde.	Geranyl formate.
2-Ethylbutyric acid.	Geranyl hexanoate
Ethyl cinnamate.	Geranyl isobutyrate.
Ethyl crotonate; <i>trans</i> -2-butenoic acid ethylester.	Geranyl isovalerate.
Ethyl cyclohexanepropionate.	Geranyl phenylacetate.
Ethyl decanoate.	Geranyl propionate.
2-Ethylfuran.	Glucose pentaacetate.
Ethyl 2-furanpropionate.	Guaiacol; μ -methoxyphenol.
4-Ethylguaiacol; 4-ethyl-2-methoxyphenol.	Guaiacyl acetate; μ -methoxyphenyl acetate.
Ethyl heptanoate.	Guaiacyl phenylacetate.
2-Ethyl-2-heptenal; 2-ethyl-3-butylacrolein.	Guaiene; 1,4-dimethyl-7-isopropenyl- Δ 9,10-octahydroazulene.
Ethyl hexanoate.	Guaiol acetate; 1,4-dimethyl-7-(α -hydroxy-isopropyl)-8 β ,10-octahydroazulene acetate.
Ethyl isobutyrate.	γ -Heptalactone; 4-hydroxyheptanoic acid, γ -lactone.
Ethyl isovalerate.	Heptanal; enanthaldehyde.
Ethyl lactate.	Heptanal dimethyl acetal.
Ethyl laurate.	Heptanal 1,2-glyceryl acetal.
Ethyl levulinate.	2,3-Heptanedione; acetyl valeryl.
Ethyl maltol; 2-ethyl-3-hydroxy-4H-pyran-4-one.	3-Heptanol.
Ethyl 2-methylbutyrate.	2-Heptanone; methyl amyl ketone.
Ethyl myristate.	3-Heptanone; ethyl butyl ketone.
Ethyl nitrite.	4-Heptanone; dipropyl ketone.

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Heptyl butyrate.	Isoamyl isovalerate.
Heptyl cinnamate.	Isoamyl laurate.
Heptyl formate.	Isoamyl-2-methylbutyrate; isopentyl-2-methylbutyrate.
Heptyl isobutyrate.	Isoamyl nonanoate.
Heptyl octanoate.	Isoamyl octanoate.
1-Hexadecanol; cetyl alcohol.	Isoamyl phenylacetate.
ω-6-Hexadecenolactone; hexadecenoic acid, α-lactone; ambrettolide.	Isoamyl propionate.
γ-Hexalactone; 4-hydroxyhexanoic acid, γ-lactone; tonkalide.	Isoamyl pyruvate.
Hexanal; caproic aldehyde.	Isoamyl salicylate.
2,3-Hexanedione; acetyl butyryl.	Isoborneol.
Hexanoic acid; caproic acid.	Isobornyl acetate.
2-Hexenal.	Isobornyl formate.
2-Hexen-1-ol.	Isobornyl isovalerate.
3-Hexen-1-ol; leaf alcohol.	Isobornyl propionate.
2-Hexen-1-yl acetate.	Isobutyl acetate.
3-Hexenyl isovalerate.	Isobutyl acetoacetate.
3-Hexenyl 2-methylbutyrate.	Isobutyl alcohol.
3-Hexenyl phenylacetate; cis-3-hexenyl phenylacetate.	Isobutyl angelate; isobutyl cis-2-methyl-2-butenoate.
Hexyl acetate.	Isobutyl anthranilate.
2-Hexyl-4-acetoxytetrahydrofuran.	Isobutyl benzoate.
Hexyl alcohol.	Isobutyl butyrate.
Hexyl butyrate.	Isobutyl cinnamate.
α-Hexylcinnamaldehyde.	Isobutyl formate.
Hexyl formate.	Isobutyl 2-furanpropionate.
Hexyl hexanoate.	Isobutyl heptanoate.
2-Hexylidene cyclopentanone.	Isobutyl hexanoate.
Hexyl isovalerate.	Isobutyl isobutyrate.
Hexyl 2-methylbutyrate.	α-Isobutylphenethyl alcohol; isobutyl benzyl carbinol; 4-methyl-1-phenyl-2-pentanol.
Hexyl octanoate.	Isobutyl phenylacetate.
Hexyl phenylacetate; n-hexyl phenylacetate.	Isobutyl propionate.
Hexyl propionate.	Isobutyl salicylate.
Hydroxycitronellal; 3,7-dimethyl-7-hydroxyoctanal.	2-Isobutylthiazole.
Hydroxycitronellal diethyl acetal.	Isobutyrilaldehyde.
Hydroxycitronellal dimethyl acetal.	Isobutyric acid.
Hydroxycitronellal; 3,7-dimethyl-1,7-octanediol.	Isoeugenol; 2-methoxy-4-propenylphenol.
N-(4-Hydroxy-3-methoxybenzyl)-nonanamide; pelargonyl vanillylamine.	Isoeugenyl acetate.
5-Hydroxy-4-octanone; butyroin.	Isoeugenyl benzyl ether; benzyl isoeugenol.
4-(p-Hydroxyphenyl)-2-butanone; p-hydroxybenzyl acetone.	Isoeugenyl ethyl ether; 2-ethoxy-5-propenyl anisole; ethyl isoeugenol.
Indole.	Isoeugenyl formate.
α-Ionone; 4-(2,6,6-trimethyl-2-cyclohexen-1-yl)-3-buten-2-one.	Isoeugenyl methyl ether; 4-propenylveratrole; methyl isoeugenol.
β-Ionone; 4-(2,6,6-trimethyl-1-cyclohexen-1-yl)-3-buten-2-one.	Isoeugenyl phenylacetate.
α-Irone; 4-(2,5,6,6-tetramethyl-2-cyclohexen-1-yl)-3-buten-2-one; 6-methylionone.	Isojasmon; mixture of 2-hexylidenecyclopentanone and 2-hexyl-2-cyclopenten-1-one.
Isoamyl acetate.	α-Isomethylionone; 4-(2,6,6-trimethyl-2-cyclohexen-1-yl)-3-methyl-3-buten-2-one; methyl γ-ionone.
Isoamyl acetoacetate.	Isopropyl acetate.
Isoamyl alcohol; isopentyl alcohol; 3-methyl-1-butanol.	p-Isopropylacetophenone.
Isoamyl benzoate.	Isopropyl alcohol; isopropanol.
Isoamyl butyrate.	Isopropyl benzoate.
Isoamyl cinnamate.	p-Isopropylbenzyl alcohol; cuminic alcohol; p-cymen-7-ol.
Isoamyl formate.	Isopropyl butyrate.
Isoamyl 2-furanbutyrate; α-isoamyl furfurylpropionate.	Isopropyl cinnamate.
Isoamyl 2-furanpropionate; furfurylacetate.	Isopropyl formate.
Isoamyl hexanoate.	Isopropyl hexanoate.
Isoamyl isobutyrate.	Isopropyl isobutyrate.
	Isopropyl isovalerate.
	ρ-Isopropylphenylacetaldehyde; p-cymen-7-carboxaldehyde.
	Isopropyl phenylacetate.

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3-(*p*-Isopropylphenyl)-propionaldehyde; *p*-isopropylhydrocinnamaldehyde; cuminaldehyde.
Isopropyl propionate.
Isopulegol; *p*-menth-8-en-3-ol.
Isopulegone; *p*-menth-8-en-3-one.
Isopulegyl acetate.
Isoquinoline.
Isovaleric acid.
cis-Jasmone; 3-methyl-2-(2-pentenyl)-2-cyclopenten-1-one.
Lauric aldehyde; dodecanal.
Lauryl acetate.
Lauryl alcohol; 1-dodecanol.
Lepidine; 4-methylquinoline.
Levulinic acid.
Linalool oxide; *cis*- and *trans*-2-vinyl-2-methyl-5-(1'-hydroxy-1'-methylene) tetrahydrofuran.
Linalyl anthranilate; 3,7-dimethyl-1,6-octadien-3-yl anthranilate.
Linalyl benzoate.
Linalyl butyrate.
Linalyl cinnamate.
Linalyl formate.
Linalyl hexanoate.
Linalyl isobutyrate.
Linalyl isovalerate.
Linalyl octanoate.
Linalyl propionate.
Maltol; 3-hydroxy-2-methyl-4H-pyran-4-one.
Menthadienol; *p*-mentha-1,8(10)-dien-9-ol.
p-Mentha-1,8-dien-7-ol; perillyl alcohol.
Menthadienyl acetate; *p*-mentha-1,8(10)-dien-9-yl acetate.
p-Menth-3-en-1-ol.
1-Menth-9-en-9-yl acetate; *p*-menth-1-en-9-yl acetate.
Menthol; 2-isopropyl-5-methylcyclohexanol.
Menthone; *p*-menthan-3-one.
Menthyl acetate; *p*-menth-3-yl acetate.
Menthyl isovalerate; *p*-menth-3-yl isovalerate.
o-Methoxybenzaldehyde.
p-Methoxybenzaldehyde; *p*-anisaldehyde.
o-Methoxycinnamaldehyde.
2-Methoxy-4-methylphenol; 4-methylguaiacol; 2-methoxy-*p*-cresol.
4-(*p*-Methoxyphenyl)-2-butanone; anisyl acetone.
1-(*p*-Methoxyphenyl)-4-methyl-1-penten-3-one; methoxystyryl isopropyl ketone.
1-(*p*-Methoxyphenyl)-1-penten-3-one; α -methylanisylidene acetone; ethone.
1-(*p*-Methoxyphenyl)-2-propanone; anisylmethyl ketone; anisic ketone.
2-Methoxy-4-vinylphenol; *p*-vinylguaiacol.
Methyl acetate.
4'-Methylacetophenone; *p*-methylacetophenone; methyl *p*-tolyl ketone.
2-Methylallyl butyrate; 2-methyl-2-propenyl butyrate.
Methyl anisate.
o-Methylanisole; *o*-cresyl methyl ether.
p-Methylanisole; *p*-cresyl methyl ether; *p*-methoxytoluene.

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Methyl benzoate.
Methylbenzyl acetate, mixed *o*-, *m*-, *p*-.
 α -Methylbenzyl acetate; styralyl acetate.
 α -Methylbenzyl alcohol; styralyl alcohol.
 α -Methylbenzyl butyrate; styralyl butyrate.
 α -Methylbenzyl isobutyrate; styralyl isobutyrate.
 α -Methylbenzyl formate; styralyl formate.
 α -Methylbenzyl propionate; styralyl propionate.
2-Methyl-3-butene-2-ol.
2-Methylbutyl isovalerate.
Methyl *p*-tert-butylphenylacetate.
2-Methylbutyraldehyde; methyl ethyl acetaldehyde.
3-Methylbutyraldehyde; isovaleraldehyde.
Methyl butyrate.
2-Methylbutyric acid.
 α -Methylcinnamaldehyde.
p-Methylcinnamaldehyde.
Methyl cinnamate.
2-Methyl-1,3-cyclohexadiene.
Methylcyclopentenolone; 3-methylcyclopentane-1,2-dione.
Methyl disulfide; dimethyl disulfide.
Methyl ester of rosin, partially hydrogenated (as defined in § 172.615); methyl dihydroabietate.
Methyl heptanoate.
2-Methylheptanoic acid.
6-Methyl-3,5-heptadien-2-one.
Methyl-5-hepten-2-ol.
6-Methyl-5-hepten-2-one.
Methyl hexanoate.
Methyl 2-hexanoate.
Methyl *p*-hydroxybenzoate; methylparaben.
Methyl α -ionone; 5-(2,6,6-trimethyl-2-cyclohexen-1-yl)-4-penten-3-one.
Methyl β -ionone; 5-(2,6,6-trimethyl-1-cyclohexen-1-yl)-4-penten-3-one.
Methyl Δ -ionone; 5-(2,6,6-trimethyl-3-cyclohexen-1-yl)-4-penten-3-one.
Methyl isobutyrate.
2-Methyl-3-(*p*-isopropylphenyl)-propionaldehyde; α -methyl-*p*-isopropylhydrocinnamaldehyde; cyclamen aldehyde.
Methyl isovalerate.
Methyl laurate.
Methyl mercaptan; methanethiol.
Methyl *o*-methoxybenzoate.
Methyl *N*-methylanthranilate; dimethyl anthranilate.
Methyl 2-methylbutyrate.
Methyl-3-methylthiopropionate.
Methyl 4-methylvalerate.
Methyl myristate.
Methyl β -naphthyl ketone; 2'-acetonaphthone.
Methyl nonanoate.
Methyl 2-nonenanoate.
Methyl 2-nonynoate; methyloctyne carbonate.
2-Methyloctanal; methyl hexyl acetaldehyde.
Methyl octanoate.
Methyl 2-octynoate; methyl heptine carbonate.

4-Methyl-2,3-pentanedione; acetyl isobutryl.	1-Octanol; octyl alcohol.
4-Methyl-2-pantanone; methyl isobutyl ketone.	2-Octanol.
β -Methylphenethyl alcohol; hydratropyl alcohol.	3-Octanol.
Methyl phenylacetate.	2-Octanone; methyl hexyl ketone.
3-Methyl-4-phenyl-3-butene-2-one.	3-Octanone; ethyl amyl ketone.
2-Methyl-4-phenyl-2-butyl acetate; dimethylphenylethyl carbonyl acetate.	3-Octan-1-ol.
2-Methyl-4-phenyl-2-butyl isobutyrate; dimethylphenyl ethylcarbonyl isobutyrate.	1-Octen-3-ol; amyl vinyl carbinol.
3-Methyl-2-phenylbutyraldehyde; α -isopropyl phenylacetalddehyde.	1-Octen-3-yl acetate.
Methyl 4-phenylbutyrate.	Octyl acetate.
4-Methyl-1-phenyl-2-pantanone; benzyl isobutyl ketone.	3-Octyl acetate.
Methyl 3-phenylpropionate; methyl hydrocinnamate.	Octyl butyrate.
Methyl propionate.	Octyl formate.
3-Methyl-5-propyl-2-cyclohexen-1-one.	Octyl heptanoate.
Methyl sulfide.	Octyl isobutyrate.
3-Methylthiopropionaldehyde; methional.	Octyl isovalerate.
2-Methyl-3-tolylpropionaldehyde, mixed <i>o</i> , <i>m</i> , <i>p</i> .	Octyl octanoate.
2-Methylundecanal; methyl nonyl acetaldehyde.	Octyl phenylacetate.
Methyl 9-undecenoate.	Octyl propionate.
Methyl 2-undecynoate; methyl decyne carbonate.	ω -Pentadecalactone; 15-hydroxypentadecanoic acid, ω -lactone; pentadecanolide; angelica lactone.
Methyl valerate.	2,3-Pentanedione; acetyl propionyl.
2-Methylvaleric acid.	2-Pantanone; methyl propyl ketone.
Myrcene; 7-methyl-3-methylene-1,6-octadiene.	4-Pentenoic acid.
Myristaldehyde; tetradecanal.	1-Penten-3-ol.
<i>d</i> -Neomenthol; 2-isopropyl-5-methylcyclohexanol.	Perillaldehyde; 4-isopropenyl-1-cyclohexene-1-carboxaldehyde; <i>p</i> -mentha-1,8-dien-7-al.
Nerol; <i>cis</i> -3,7-dimethyl-2,6-octadien-1-ol.	Perillyl acetate; <i>p</i> -mentha-1,8-dien-7-yl acetate.
Nerolidol; 3,7,11-trimethyl-1,6,10-dodecatrien-3-ol.	α -Phellandrene; <i>p</i> -mentha-1,5-diene.
Neryl acetate.	Phenethyl acetate.
Neryl butyrate.	Phenethyl alcohol; β -phenylethyl alcohol.
Neryl formate.	Phenethyl anthranilate.
Neryl isobutyrate.	Phenethyl benzoate.
Neryl isovalerate.	Phenethyl butyrate.
Neryl propionate.	Phenethyl cinnamate.
2,6-Nonadien-1-ol.	Phenethyl formate.
γ -Nonalactone; 4-hydroxy-nonanoic acid, γ -lactone; aldehyde C-18.	Phenethyl isobutyrate.
Nonanal; pelargonic aldehyde.	Phenethyl isovalerate.
1,3-Nonanediol acetate, mixed esters.	Phenethyl 2-methylbutyrate.
Nonanoic acid; pelargonic acid.	Phenethyl phenylacetate.
2-Nonanone; methylheptyl ketone.	Phenethyl propionate.
3-Nonanon-1-yl acetate; 1-hydroxy-3-nonanone acetate.	Phenethyl salicylate.
Nonyl acetate.	Phenethyl senecioate; phenethyl 3,3-dimethylacrylate.
Nonyl alcohol; 1-nonanol.	Phenethyl tiglate.
Nonyl octanoate.	Phenoxyacetic acid.
Nonyl isovalerate.	2-Phenoxyethyl isobutyrate.
Nootkatone; 5,6-dimethyl-8-isopropenyl bicyclo[4.4.0]-dec-1-en-3-one.	Phenylacetaldehyde; α -toluic aldehyde.
Ocimene; <i>trans</i> - β -ocimene; 3,7-dimethyl-1,3,6-octatriene.	Phenylacetaldehyde 2,3-butylene glycol acetal.
γ -Octalactone; 4-hydroxyoctanoic acid, γ -lactone.	Phenylacetaldehyde dimethyl acetal.
Octanal; caprylaldehyde.	Phenylacetaldehyde glyceryl acetal.
Octanal dimethyl acetal.	β -Phenylacetic acid; α -toluic acid.
	4-Phenyl-2-butanol; phenylethyl methyl carbinol.
	4-Phenyl-3-buten-2-ol; methyl styryl carbinol.
	4-Phenyl-3-buten-2-one.
	4-Phenyl-2-butyl acetate; phenylethyl methyl carbonyl acetate.
	1-Phenyl-3-methyl-3-pentanol; phenylethyl methyl ethyl carbinol.
	1-Phenyl-1-propanol; phenylethyl carbinol.
	3-Phenyl-1-propanol; hydrocinnamyl alcohol.
	2-Phenylpropionaldehyde; hydratropaldehyde.

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3-Phenylpropionaldehyde;	Rhodinyl isovalerate.
hydrocinnamaldehyde.	Rhodinyl phenylacetate.
2-Phenylpropionaldehyde dimethyl acetal;	Rhodinyl propionate.
hydratropic aldehyde dimethyl acetal.	Rum ether; ethyl oxyhydrate.
3-Phenylpropionic acid; hydrocinnamic acid.	Salicylaldehyde.
3-Phenylpropyl acetate.	Santalol, α and β .
2-Phenylpropyl butyrate.	Santaryl acetate.
3-Phenylpropyl cinnamate.	Santaryl phenylacetate.
3-Phenylpropyl formate.	Skatole.
3-Phenylpropyl hexanoate.	Sorbitan monostearate.
2-Phenylpropyl isobutyrate.	Styrene.
3-Phenylpropyl isobutyrate.	Sucrose octaacetate.
3-Phenylpropyl isovalerate.	α -Terpinene.
3-Phenylpropyl propionate.	γ -Terpinene.
2-(3-Phenylpropyl)-tetrahydrofuran.	α -Terpineol; <i>p</i> -menth-1-en-8-ol.
α -Pinene; 2-pinene.	β -Terpineol.
β -Pinene; 2(10)-pinene.	Terpinolene; <i>p</i> -menth-1,4(8)-diene.
Pine tar oil.	Terpinyl acetate.
Pinocarveol; 2(10)-pinen-3-ol.	Terpinyl anthranilate.
Piperidine.	Terpinyl butyrate.
Piperine.	Terpinyl cinnamate.
<i>d</i> -Piperitone; <i>p</i> -menth-1-en-3-one.	Terpinyl formate.
Piperitenone; <i>p</i> -mentha-1,4(8)-dien-3-one.	Terpinyl isobutyrate.
Piperitenone oxide; 1,2-epoxy- <i>p</i> -menth-4-(8)-en-3-one.	Terpinyl isovalerate.
Piperonyl acetate; heliotropyl acetate.	Terpinyl propionate.
Piperonyl isobutyrate.	Tetrahydrofurfuryl acetate.
Polylimonene.	Tetrahydrofurfuryl alcohol.
Polysorbate 20; polyoxyethylene (20) sorbitan monolaurate.	Tetrahydrofurfuryl butyrate.
Polysorbate 60; polyoxyethylene (20) sorbitan monostearate.	Tetrahydrofurfuryl propionate.
Polysorbate 80; polyoxyethylene (20) sorbitan monooleate.	Tetrahydro-pseudo-ionone; 6,10-dimethyl-9-undecen-2-one.
Potassium acetate.	Tetrahydrolinalool; 3,7-dimethyloctan-3-ol.
Propenylguathol; 6-ethoxy- <i>m</i> -anol.	Tetramethyl ethylcyclohexenone; mixture of 5-ethyl-2,3,4,5-tetramethyl-2-cyclohexen-1-one and 5-ethyl-3,4,5,6-tetramethyl-2-cyclohexen-1-one.
Propionaldehyde.	2-Thienyl mercaptan; 2-thienylthiol.
Propyl acetate.	Thymol.
Propyl alcohol; 1-propanol.	Toluualdehyde glyceryl acetal, mixed <i>o</i> , <i>m</i> , <i>p</i> .
<i>p</i> -Propyl anisole; dihydroanethole.	Toluualdehydes, mixed <i>o</i> , <i>m</i> , <i>p</i> .
Propyl benzoate.	<i>p</i> -Tolylacetaldehyde.
Propyl butyrate.	<i>o</i> -Tolyl acetate; <i>o</i> -cresyl acetate.
Propyl cinnamate.	<i>p</i> -Tolyl acetate; <i>p</i> -cresyl acetate.
Propyl disulfide.	4-(<i>p</i> -Tolyl)-2-butanon; <i>p</i> -methylbenzylacetone.
Propyl formate.	<i>p</i> -Tolyl isobutyrate.
Propyl 2-furanacrylate.	<i>p</i> -Tolyl laurate.
Propyl heptanoate.	<i>p</i> -Tolyl phenylacetate.
Propyl hexanoate.	2-(<i>p</i> -Tolyl)-propionaldehyde; <i>p</i> -methylhydratropic aldehyde.
Propyl <i>p</i> -hydroxybenzoate; propylparaben.	Tributyl acetylcitrate.
3-Propylideneephthalide.	2-Tridecenal.
Propyl isobutyrate.	2,3-Undecadione; acetyl nonyryl.
Propyl isovalerate.	γ -Undecalactone; 4-hydroxyundecanoic acid γ -lactone; peach aldehyde; aldehyde C-14.
Propyl mercaptan.	Undecenal.
<i>o</i> -Propylphenethyl alcohol.	2-Undecanone; methyl nonyl ketone.
Propyl phenylacetate.	9-Undecenal; undecenoic aldehyde.
Propyl propionate.	10-Undecenal.
Pulegone; <i>p</i> -menth-4(8)-en-3-one.	Undecen-1-ol; undecylenic alcohol.
Pyridine.	10-Undecen-1-yl acetate.
Pyroligneous acid extract.	Undecyl alcohol.
Pyruvaldehyde.	Valeraldehyde; pentanal.
Pyruvic acid.	Valeric acid; pentanoic acid.
Rhodinol; 3,7-dimethyl-7-octen-1-ol; citronellol.	Vanillin acetate; acetyl vanillin.
Rhodinyl acetate.	Veratraldehyde.
Rhodinyl butyrate.	Verbenol; 2-pinene-4-ol.
Rhodinyl formate.	
Rhodinyl isobutyrate.	

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Zingerone; 4-(4-hydroxy-3-methoxyphenyl)-2-butanone.

(c) Δ-Decalactone and Δ-dodecalactone when used separately or in combination in oleomargarine are used at levels not to exceed 10 parts per million and 20 parts per million, respectively, in accordance with § 166.110 of this chapter.

(d) BHA (butylated hydroxyanisole) may be used as an antioxidant in flavoring substances whereby the additive does not exceed 0.5 percent of the essential (volatile) oil content of the flavoring substance.

[42 FR 14491, Mar. 15, 1977, as amended at 42 FR 23148, May 6, 1977; 43 FR 19843, May 9, 1978; 45 FR 22915, Apr. 4, 1980; 47 FR 27810, June 25, 1982; 48 FR 10812, Mar. 15, 1983; 48 FR 51907, Nov. 15, 1983; 49 FR 5747, Feb. 15, 1984; 50 FR 42932, Oct. 23, 1985; 54 FR 7402, Feb. 21, 1989; 61 FR 14245, Apr. 1, 1996]

§ 172.520 Cocoa with dioctyl sodium sulfosuccinate for manufacturing.

The food additive "cocoa with dioctyl sodium sulfosuccinate for manufacturing," conforming to § 163.117 of this chapter and § 172.810, is used or intended for use as a flavoring substance in dry beverage mixes whereby the amount of dioctyl sodium sulfosuccinate does not exceed 75 parts per million of the finished beverage. The labeling of the dry beverage mix shall bear adequate directions to assure use in compliance with this section.

§ 172.530 Disodium guanylate.

Disodium guanylate may be safely used as a flavor enhancer in foods, at a level not in excess of that reasonably required to produce the intended effect.

§ 172.535 Disodium inosinate.

The food additive disodium inosinate may be safely used in food in accordance with the following prescribed conditions:

(a) The food additive is the disodium salt of inosinic acid, manufactured and purified so as to contain no more than 150 parts per million of soluble barium in the compound disodium inosinate with seven and one-half molecules of water of crystallization.

(b) The food additive is used as a flavoring adjuvant in food.

§ 172.540 DL-Alanine.

DL-Alanine (a racemic mixture of D- and L-alanine; CAS Reg. No. 302-72-7) may be safely used as a flavor enhancer for sweeteners in pickling mixtures at a level not to exceed 1 percent of the pickling spice that is added to the pickling brine.

[56 FR 6968, Feb. 21, 1991]

§ 172.560 Modified hop extract.

The food additive modified hop extract may be safely used in beer in accordance with the following prescribed conditions:

(a) The food additive is used or intended for use as a flavoring agent in the brewing of beer.

(b) The food additive is manufactured by one of the following processes:

(1) The additive is manufactured from a hexane extract of hops by simultaneous isomerization and selective reduction in an alkaline aqueous medium with sodium borohydride, whereby the additive meets the following specifications:

(i) A solution of the food additive solids is made up in approximately 0.012 *n* alkaline methyl alcohol (6 milliliters of 1 *n* sodium hydroxide diluted to 500 milliliters with methyl alcohol) to show an absorbance at 253 millimicrons of 0.6 to 0.9 per centimeter. (This absorbance is obtained by approximately 0.03 milligram solids permilliliter.) The ultraviolet absorption spectrum of this solution exhibits the following characteristics: An absorption peak at 253 millimicrons; no absorption peak at 325 to 330 millimicrons; the absorbance at 268 millimicrons does not exceed the absorbance at 272 millimicrons.

(ii) The boron content of the food additive does not exceed 310 parts per million (0.0310 percent), calculated as boron.

(2) The additive is manufactured from hops by a sequence of extractions and fractionations, using benzene, light petroleum spirits, and methyl alcohol as solvents, followed by isomerization by potassium carbonate treatment. Residues of solvents in the modified hop extract shall not exceed 1.0 part per million of benzene, 1.0 part per million of light petroleum spirits, and 250